

WHAT IS CLAIMED IS:

- 1 A charge processing device comprising:
 - detecting means for detecting position information indicating a position where a moving body is located;
 - matching means for matching the position information with predetermined map information;
 - deciding means for deciding, based on a result of a matching by the matching means, an entry state indicating whether or not the moving body has at least entered into an area in which a charge is applied that corresponds to a predetermined area set in advance in the map information; and
 - generating means for generating, based on a result of a deciding by the deciding means, charge information for the moving body.
- 2 The charge processing device according to claim 1, the charge processing device further comprising location information detecting means for detecting, based on the position information, location information indicating date and time the moving body is located in the area in which a charge is applied, wherein the deciding means decides, based on the result of the matching by the matching means and a result of a detection by the location information detecting means, the entry state including a location state of the moving body within the area in which a charge is applied.
- 3 The charge processing device according to claim 1 or 2, wherein

the generating means decides the entry state including a congestion state caused by moving bodies located in the area in which a charge is applied.

4 The charge processing device according to any of claim 1 through claim 3, wherein the generating means is further provided with storage means in which predetermined toll data corresponding to the entry state is stored in advance, and the generating means generates the charge information using the toll data in the storage means.

5 A charge processing device comprising:

host position detecting means for detecting a position of a host moving body;

transceiving means for transmitting position information of the host moving body to the ground side, and for receiving charge data relating to a predetermined area in which a charge is applied, using wireless communication; and

charge processing means for performing charge processing relating to the area in which a charge is applied, based on a result of a transmission and reception by the transceiving means, wherein

the host position detecting means, the transceiving means, and the charge processing means are able to be mounted on a moving body.

6 The charge processing device according to claim 5, wherein the charge processing means performs the charge processing using an IC card on which balance information is stored.

7 A charge processing device comprising:

detecting means for detecting position information

representing a position where a moving body is located;

charge means for executing charge processing for the moving body when the moving body has entered into a predetermined area in which a charge is applied, based on a result of a detection by the detecting means;

notification means which is mounted on the moving body and which notifies the outside of the moving body of a processing state of the charge processing in a notifying state corresponding to the processing state; and

continuing means for continuing a notification by the notification means during the moving body is located inside the area in which a charge is applied, based on a result of the detection by the detecting means.

8 The charge processing device according to claim 7, wherein the notification means is a radiation means for radiating electromagnetic waves towards the outside of a vehicle.

9 The charge processing device according to claim 7 or 8, wherein the notification means is constructed as a light source disposed on the detecting means, or on a number plate the moving body, or in an area around the number plate of the moving body.

10 The charge processing device according to any of claims 9 through 7, wherein the notification means performs notification in a predetermined operating pattern in which the notification state is altered in the manner of a time series.

11 The charge processing device according to claim 10, wherein the

notification means is further provided with receiving means for receiving a pattern signal representing the operating pattern, and notification of the processing state is made to the outside of a vehicle based on the pattern signal.

12 The charge processing device according to any of claims 7 through 11, wherein the notification means is structured from a vehicle exterior notification means for notifying the outside of the vehicle of the processing state, and a vehicle interior notification means for notifying the inside of the vehicle of the processing state, and notification of the processing state is made to the interior and exterior of the vehicle.

13 A charge processing device further comprising observation means for observing a notification from the notification means provided in the charge processing device according to any of claims 7 through 12.

14 The charge processing device according to claim 13, wherein the observation means observes a notification by detecting at least brightness.

15 The charge processing device according to claim 13, wherein the observation means is an image pickup means capable of picking up either one or a plurality of images having at least brightness.

16 The charge processing device according to any of claims 13 through 15, wherein the observation means observes a notification by detecting at least brightness in synchronization with the observation pattern determined in advance that is altered in the manner of a time series.

17 The charge processing device according to claim 16, wherein the observation means is further provided with receiving means for receiving a pattern signal indicating the observation pattern, and the observation means observes a notification in synchronization with the observation pattern based on the pattern signal.

18 The charge processing device according to any of claims 13 through 17, wherein the charge processing device is further provided with deciding means for deciding a processing state of the charge processing based on an observation result by the observation means.

19 The charge processing device according to claim 18, wherein the deciding means is provided with comparing means for comparing a notification state of a notification obtained by the observation means with a predetermined notification state, and processing deciding means for deciding a processing state of the charge processing based on a comparison result by the comparing means.

20 A charge processing device comprising in a manner in which each is portable:

receiving means for receiving a pattern signal indicating an observation pattern altered in the manner of a time series in order to observe a notification from a notification means provided in the charge processing device according to any of claims 7 through 12; and

presenting means for presenting notification information corresponding to the observation pattern in synchronization with the observation pattern based on the pattern signal,

21 The charge processing device according to claim 20, wherein the

charge processing device according to claim 20, wherein the presenting means presents observation information by at least one of sound and light.

22 A charge processing device comprising:

detecting means for detecting position information indicating a position where a moving body is located;

making means for generating charge information for the moving body in a predetermined area in which a charge is applied, as well as making a charge history of the generated charge information based on a detection result by the detecting means; and

transmitting means for transmitting the charge history of the charge information generated by the generating means to the ground side.

23 The charge processing device according to claim 22, wherein the making means is formed from generating means for generating charge information for each of a plurality of existing areas where a charge is applied, and accumulating means for accumulating in sequence the generated charge information as charge history.

24 The charge processing device according to claim 22 or 23, wherein the detecting means detects the position information using satellite signals from satellites.

25 The charge processing device according to any of claims 22 through 24, wherein the making means is further provided with matching means for matching the position information with predetermined map information, and with deciding means for

deciding, based on a matching result by the matching means, a entry state indicating at least whether or not the moving body has entered into a predetermined area in which a charge is applied in the map information, and the charge information is generated based on a result of a decision by the deciding means.

26 A charge processing system comprising:

in-vehicle communication means which is provided with the charge processing device according to any of claims 1 through 4 and in which the transmission means transmits charge history in accordance with an input transmission request: and

on-road communication means having request means for performing the transmission request and processing means for performing charge settlement processing in a predetermined processing area and based on a transmitted charge history.

27 The charge processing system according to claim 26, wherein the on-road communication means is further provided with altering means for altering the amount of the charge settlement based on a time until an arrival in the processing area.

28 A charge processing device comprising:

detecting means for detecting position information indicating a position where a moving body is located;

storage means capable of being inserted and removed for storing a predetermined area in which a charge is applied; and

generating means for generating charge information for the moving body based on a result of a detection by the detecting means

and the area in which a charge is applied stored in the loaded storage means.

29 The charge processing device according to claim 28, wherein the generating means is provided with a reading means for reading a result of a detection by the detecting means and the area in which a charge is applied stored in the storage means, and generates charge information from the read position information and the area in which a charge is applied.

30 The charge processing device according to claim 1 or claim 29, wherein the storage means is a toll card on which is stored the area in which a charge is applied for generating at least charge information.

31 A charge processing card comprising:

- a loading portion for loading in an in-vehicle device that detects position information indicating a position where a moving body is located, and generates charge information from the position information and a predetermined area in which a charge is applied;

- an area storage portion for storing the area in which a charge is applied; and

- a balance storage section for storing balance information.

32 A charge processing device carried by a user or mounted on a moving body comprising:

- means for detecting a ground position;

- storage means for storing area specifying information and inside-area control information;

- notification control means for generating position relation

information in a charge processing device for an area indicated by area specifying information, based on the ground position detected by the ground position detecting means and the area specifying information of the storage means; and

notification means for notifying a user as to information expressed by the area specifying information and the inside-area control information and the position relation information.

33 A charge processing device carried by a user or mounted on a moving body comprising:

means for detecting a ground position;

storage means for storing charge area specifying information, inside-area charge information, and credit information;

notification control means for generating position relation information in a charge processing device for a charge area indicated by the charge area specifying information, based on the ground position detected by the ground position detecting means and the charge area specifying information of the storage means, and updating the credit information in the storage means in response to changes outside and inside the ground position relative to the charge area; and

notification means for notifying a user as to information expressed by the charge area specifying information, the inside-area charge information, and the credit information and the position relation information.

34 A charge processing system comprising:

a notification device that is a charge processing device

carried by a user or mounted on a moving body and includes
means for detecting a ground position,
communication means for receiving area specifying
information,
storage means for storing received area specifying
information,
notification control means for generating position
relation information in a charge processing device for an area
indicated by the area specifying information based on the ground
position detected by the ground position detecting means and the area
specifying information of the storage means, and
notification means for notifying a user as to the position
relation information; and
a transmitting station comprising
public notification information storage means for storing
the area specifying information, and
transmitting means for transmitting the area specifying
information of the public notification information storage means.

35 A charge processing system comprising:

a notification device that is a charge processing device
carried by a user or mounted on a moving body and includes
means for detecting a ground position,
communication means for receiving charge area
specifying information and inside-area charge information,
storage means for storing received charge area

specifying information and inside-area charge information, and credit information,

notification control means for generating position relation information in a charge processing device for a charge area, based on the ground position detected by the ground position detecting means and the charge area specifying information of the storage means, and updating the credit information in the storage means in response to changes outside and inside the ground position relative to the charge area, and

notification means for notifying a user as to information expressed by the charge area specifying information, the inside-area charge information, and the credit information and the position relation information; and

a transmitting station comprising

public notification information storage means for storing area specifying information and the inside-area charge information, and

transmitting means for transmitting the area specifying information and the inside-area charge information of the public notification information storage means.

36 A charge processing device carried by a user or mounted on a moving body comprising:

means for detecting a ground position;

storage means for storing area specifying information and credit information;

relative position determining means for calculating whether the ground position detected by the ground position detecting means is inside or outside an area represented by the area specifying information in the storage means;

interruption instruction means;

time measuring means for measuring a time elapsed inside the area during a period in which there is no interruption instruction from the interruption instruction means; and

charge processing means for updating the credit information based on a value of a time measured by the time measuring means.

37 A charge processing device carried by a user or mounted on a moving body comprising:

means for detecting a ground position;

storage means for storing area specifying information and credit information;

relative position determining means for calculating whether the ground position detected by the ground position detecting means is inside or outside an area represented by the area specifying information in the storage means;

distance measuring means for measuring a distance moved within the area; and

charge processing means for updating the credit information based on a distance measured by the distance measuring means.

38 The charge device according to claim 36 or 37, wherein the charge device further comprises notification means for notifying a user about

information representing the area specifying information and the credit information.

39 The charge processing device according to claim 36 or 37, wherein the charge processing device further comprises: notification control means for generating approach information that the charge processing device is approaching the area represented by the area specifying information based on the ground position detected by the ground position detecting means and the area specifying information of the storage means; and notification means for notifying a user about information representing the approach information, the area specifying information, and the credit information.

40 A charge processing system comprising:

a charge device that is carried by a user or mounted on a moving body and is provided with

- means for detecting a ground position,
- communication means for receiving area specifying information,
- storage means for storing received area specifying information, and credit information,
- relative position determining means for calculating whether the ground position detected by the ground position detecting means is inside or outside an area represented by the area specifying information in the storage means;
- interruption instruction means,
- time measuring means for measuring the time elapsed

inside the area during a period in which there is no interruption instruction from the interruption instruction means, and

charge processing means for updating the credit information based on a value of a time measured by the time measuring means; and

a transmitting station that includes

public notification information storage means for the storing area specifying information, and

transmitting means for transmitting the area specifying information of the public notification information storage means.

41 The charge processing device or charge processing system according to claim 36 or claim 40, wherein the charge processing device is mounted on a moving body, and the interruption instruction means performs an interruption instruction interconnectedly with the off operation of an ignition of the moving body.

42 A charge processing system comprising:

a charge processing device that is carried by a user or mounted on a moving body and is provided with

means for detecting a ground position,

communication means for receiving area specifying information,

storage means for storing received area specifying information, and credit information,

relative position determining means for calculating whether the ground position detected by the ground position

detecting means is inside or outside an area represented by the area specifying information in the storage means;

distance measuring means for measuring a distance moved inside the area, and

charge processing means for updating the credit information based on a distance measured by the distance measuring means; and

a transmitting station that includes

public notification information storage means for storing the area specifying information, and

transmitting means for the transmitting area specifying information of the public notification information storage means.

43 A charge processing device comprising:

storage means for storing credit information;

read and write means for reading the credit information from the storage means and writing the credit information to the storage means;

entry detecting means for detecting an entry into a charge area;

charge processing means for updating, in accordance with a charge toll, the credit information in the storage means via the read and write means in response to traffic in the charge area; and

communication means for transmitting charge device state information including whether or not reading and writing of credit information in the storage means is possible while in the charge area.

44 A charge processing device comprising:

means for detecting a ground position;

storage means for storing credit information, charge area,
and charge tolls;

charge processing means for detecting whether the ground
position detected by the ground position detecting means is within the
charge area, and updating, in accordance with the charge toll, credit
information in the storage means in response to a traffic in the charge
area; and

communication means for transmitting charge device state
information including whether or not ground position detection by the
ground position detecting means is possible while in the charge area.

45 A charge processing system comprising:

a charge processing device that includes

storage means for storing credit information,

read and write means for reading the credit information
from the storage means and writing the credit information to the
storage means,

entry detecting means for detecting an entry into a
charge area,

charge processing means for updating, in accordance
with the charge toll, the credit information in the storage means via the
read and write means in response to a traffic in the charge area, and

first communication means for receiving a data request
and transmitting charge device state information including whether or

not reading and writing of credit information in the storage means is possible while in the charge area; and

a control station that includes

second communication means for transmitting the data request to the charge processing device and receiving the charge processing device state information from the charge processing device, and

serching means for checking for erroneous use of the charge processing device based on received data.

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